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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,344	10/02/2000	Balakrishnan Sridhar	327	3540

7590 04/30/2003

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EXAMINER

CUNNINGHAM, STEPHEN C

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/677,344	SRIDHAR ET AL.
Examiner	Art Unit	
Stephen C. Cunningham	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 14 February 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5,7-21,23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5,7-21,23 and 24 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1, 7, 8, 10, 11, 13, 14, 16, 19, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shima et al. in view of Taylor et al. (US 6,057,959).

With respect to claim 1, Shima et al teach an optical amplification device, comprising:

- a first active optical fiber with a first end coupled to an optical communication path and an output second end;
- a dispersion compensating element coupled to the second end portion of the first active optical fiber;
- a second active optical fiber with a first end coupled to the dispersion compensating element and a second end;
- a variable attenuator (VAT) connected to the second end of the second active optical fiber;
- a third active optical fiber with a first end connected to the output of the variable attenuator; and
- a control circuit, sensing an input optical power and outputting the attenuation control signal. See figures 1 and 3, and column 11, lines 27-43.

Taylor et al teach a memory circuit storing an attenuation adjustment value and a control circuit that outputs the attenuation control signal to the attenuator, see column 4, lines 30-44. It would have been obvious to modify the apparatus of Shima et al by including in the control circuitry a memory device as taught by Taylor et al.

With respect to claim 7, Shima et al teach an amplification device further comprising a filter with an input coupled to the second end of the second active optical fiber and an output coupled to the VAT. See figures 1 and 3, specifically filter 35 in amplification stage 3.

With respect to claim 8, Shima et al teach an amplification device wherein the filter of claim 7 is a gain-flattening filter. See, for example, column 7, lines 29-31 and 48-49.

With respect to claim 10, Shima et al teach an amplification device further comprising:

a first optical filter connected intermediate the second active optical fiber and the VAT; and

a second optical filter connected intermediate the VAT and the third active optical fiber.

See figures 1 and 3.

With respect to claim 11, Shima et al teach an amplification device wherein the filters of claim 10 are gain-flattening filters. See, for example, column 7, lines 29-31, 48-49 and column 8, lines 10-13.

With respect to claim 13, Shima et al teach that the dispersion-compensating element is a dispersion compensating fiber.

With respect to claim 14, Shima et al teaches a dispersion compensating fiber which is a well known functional equivalent to the dispersion compensating Bragg grating. It would have been obvious to modify the apparatus of Shima et al by substituting a dispersion compensating Bragg grating for the dispersion compensating fiber as a matter of design choice that produces no unexpected results.

With respect to claim 16, With respect to claim 8, Shima et al teach an amplification device further comprising a first and a second pump coupled to the first and second active optical fibers respectively and wherein the pumps both operate at 980 nm. See column 7, lines 44-49 and column 8, lines 16-28.

With respect to claim 19, Shima et al teach the method, inherent in the apparatus, of controlling comprising:

- amplifying with a first amplification stage;
- dispersion compensating the optical signals;
- amplifying with a second amplifying stage;
- optically attenuating;
- amplifying with a third amplifying stage;
- sensing an input optical power of signals input into the first amplification stage;

controlling the optical attenuator. See figures 1 and 3.

With respect to claim 23, Shima et al teach the inherent method further comprising filtering the signals intermediate the second and third amplification stages with a gain-flattening filter. See figures 1 and 3, specifically filter 35 in amplification stage 3 and column 7, lines 29-31 and 48-49.

2. Claims 2-5, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shima et al. in view of Taylor et al., as applied to claims 1 and 19, and further in view of Yang et al.

With respect to claims 2 and 20, Shima et al teach a photodetector coupled to the first end of the first active optical fiber and a processing unit coupled to the photodetector, but fail to teach a memory device. Yang et al teach a memory device, storing an attenuation factor, coupled to a processing unit. Dispersion compensating elements contribute significant loss to the system and would necessarily be accounted for in an attenuation factor. It would have been obvious to modify the apparatus of Shima et al to provide a memory device storing dispersion compensation power loss in order to provide accurate attenuation control in the apparatus.

With respect to claims 3 and 21, Shima et al teach a control circuit including:

a first photodetector coupled to the first end of the first active optical fiber;

a second photodetector coupled to an input port of the dispersion compensating element ;

a third photodetector connected to an output port of the dispersion compensating element;

and a processing unit that outputs an attenuation control signal.

Yang et al teach a memory device, storing an attenuation factor, coupled to a processing unit. Dispersion compensating elements contribute significant loss to the system and would necessarily be accounted for in an attenuation factor. It would have been obvious to modify the device of Shima et al by storing the significant static loss values in a memory device and detecting the signal power to control the attenuator accurately and dynamically.

With respect to claim 4, Shima et al teach a control circuit including:

a first photodetector coupled to the first end of the first active optical fiber;

a second photodetector coupled to the input of the variable attenuator;

a third photodetector coupled to the output of the dispersion compensating element;

a comparator inherent in the gain control;

and a processing unit, the AGC.

Yang et al teach a memory device, storing an attenuation factor, coupled to a processing unit. Dispersion compensating elements contribute significant loss to the system and would necessarily be accounted for in an attenuation factor. It would have been obvious to modify the device of Shima et al by storing the significant static loss values in a memory device and detecting the signal power to control the attenuator accurately and dynamically.

With respect to claim 5, Shima et al teach a circuit including:

a first photodetector coupled to the first end of the first active optical fiber;

a second photodetector coupled to the input of the variable attenuator;

a third photodetector coupled to the output of the dispersion compensating element;

and a processing unit, the AGC.

Yang et al teach a memory device, storing an attenuation factor, coupled to a processing unit. Dispersion compensating elements contribute significant loss to the system and would necessarily be accounted for in an attenuation factor. It would have been obvious to modify the device of Shima et al by storing the significant static loss

values in a memory device and detecting the signal power to control the attenuator accurately and dynamically.

3. Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shima et al. in view of Taylor et al., as applied to claims 7 and 10, and further in view of Alexander et al.

Shima et al fails to teach service channel monitoring. Alexander et al teach a monitoring apparatus including a service channel transmitter coupled to an input port of an optical filter and a service channel receiver coupled to an output port of said optical filter. It would have been obvious to modify the apparatus of Shima et al by substituting the service channel monitoring device as taught by Alexander for one of the optical filters in order to monitor system performance.

4. Claim 15, 17, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker et al in view of Shima et al. in view of Taylor et al., as applied to claims 1, 16, and 19, and further in view of Becker et al.

With respect to claims 15, 17 and 24, Shima et al. teaches a three stage optical amplifier where the first stage is low noise, the combination of the first and second stage provide high gain and low noise amplification, and the third stage provides high power amplification (column 6, lines 25-26, 62-64 and column 7, lines 57-60). Shima et al. suggests a low gain

first stage amplifier, relative to the pre-stage amplifier in a two-stage amplifier, in order to increase the acceptable range of input powers. Becker et al. teach that a multistage amplifier comprises a low-noise, high-gain first stage amplifier and a high power second stage amplifier. By amplifying the input signal with a low noise amplifier greater power in subsequent stages is utilized in amplifying the signal light rather than noise lights. It would have been obvious to modify the apparatus by making both the first and second amplification stages high-gain and low noise amplifiers in order to achieve amplification reduce the noise power.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Shima et al.

Taylor et al teach a communication system comprising:

- a plurality of transmitters;
- an optical combiner;
- a plurality optical amplification devices;
- an optical demultiplexer;
- a plurality of optical receivers;
- a plurality of received power modules;
- a monitoring circuit; and
- a plurality of tilt control circuits, see figure 12.

Taylor et al fail to teach the specific configuration of amplification devices. It would have been obvious to modify the apparatus of Taylor et al by substituting the specific amplifier as taught by Shima et al for the generic optical amplifiers of Taylor in order to provide a system that is wavelength independent and functions with power level in a wide dynamic range.

Response to Amendment

The rejection of claim 18, based on obviousness type double patenting, has been overcome by the filing of the terminal disclaimer. The rejection is withdrawn.

Response to Arguments

The applicant has argued that Taylor et al. P.N. 6,057,959 is disqualified as prior art for rejections under 35 U.S.C. 103 (a) by 35 U.S.C. 103 (c) which states:

Subject matter developed by another person, which qualifies as prior art **only** under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

The applicants assertion is inaccurate because the Taylor reference qualifies as prior art under 35 U.S.C. 102 (a) therefore 35 U.S.C. 103 (c) does not exclude the reference as prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sakano et al. (US 6,433,925) teaches a optical fiber amplifier

comprising: a variable optical attenuator; a memory device that stores an attenuator offset value; and a control circuit that receives the attenuator offset value and controls the attenuator in response to the offset value and the input power, for example figure 4 and column 13, line 49 - column 14, line 5.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

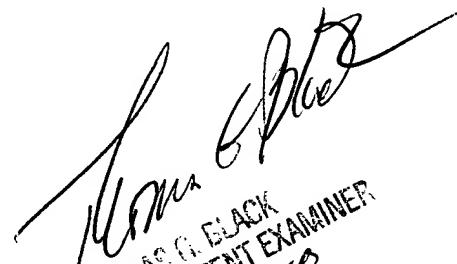
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 703-305-8233. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

SCC
April 23, 2003



Thomas G. Black
SUPERVISORY PATENT EXAMINER
GROUP 3600